

CLAIMS

1 1. A circuit for controlling an array of n electrostatic actuators,
2 where n is an integer, comprising:

3 at least one high voltage generator for providing a desired
4 voltage;

5 n switches operably connected to said generator, each switch
6 being directly connected to one of said n electrostatic actuators;

7 n capacitors, one of which is connected in parallel to each of
8 said n actuators for receiving voltage from said high voltage generator
9 through said switch; and

10 a central processor for controlling said desired voltage, said
11 processor further controlling the time each of said n switches is
12 closed to apply said voltage to said capacitors and electrostatic
13 actuators to establish and/or restore said desired voltage therein.

1 2. The circuit of claim 1, wherein the output of said high voltage
2 generator is a constant high voltage.

1 3. The circuit of claim 1, wherein the output of said high voltage
2 generator is a constant slope, ramp high voltage.

1 4. The circuit of claim 1, wherein the output of said high voltage
2 generator is a multiple successive slope, ramp high voltage.

1 5. The circuit of claim 4, wherein said multiple successive, ramp
2 high voltage contains different slopes to minimize the time of
3 actuation of said n switches.

1 6. The circuit of claim 1, wherein the output of said high voltage
2 generator is a staircase high voltage.

1 7. The circuit of claim 1, wherein the output of said high voltage
2 generator has an output switch for minimizing the power.

1 8. The circuit of claim 1, wherein n is at least 1,000.

1 9. The circuit of claim 1, wherein n is between 1,000 and 10,000.

1 10. The circuit of claim 1, wherein said central processor is adapted
2 to calculate the voltage leakage for each of said n electrostatic
3 actuators and capacitors to thereby determine the time said switch is
4 closed.

1 11. A circuit for controlling an array of n electrostatic actuators,
2 where n is an integer, comprising:

3 at least one high voltage generator means for providing a desired
4 voltage;

5 n switch means for transmitting said desired voltage and
6 operably connected to said generator, each switch means being
7 directly connected to one of said n electrostatic actuators;

8 n capacitor means for storing said voltage, one of which is
9 connected in parallel to each of said n actuators for receiving voltage
10 from said high voltage generator means through said switch means;
11 and

12 central processor means for controlling said desired voltage,
13 said processor means further controlling the time each of said n
14 switch means is closed to apply said voltage to said capacitor means
15 and electrostatic actuators to restore said desired voltage therein.

1 12. The circuit of claim 11, wherein the output of said high voltage
2 generator means is a constant high voltage.

1 13. The circuit of claim 11, wherein the output of said high voltage
2 generator means is a constant slope, ramp high voltage.

1 14. The circuit of claim 11, wherein the output of said high voltage
2 generator means is a multiple successive slope, ramp high voltage.

1 15. The circuit of claim 14, wherein said multiple successive, ramp
2 high voltage contains different slopes to minimize the time of
3 actuation of said n switch means.

1 16. The circuit of claim 11, wherein the output of said high voltage
2 generator means is a staircase high voltage

1 17. The circuit of claim 11, wherein n is at least 1,000.

1 18. The circuit of claim 11, wherein n is between 1,000 and 10,000.

1 19. The circuit of claim 11, wherein said central processor means is
2 adapted to calculate the voltage leakage for each of said n electrostatic
3 actuators and capacitor means to thereby determine the time said
4 switch is closed.

1 20. A method for controlling an array of n electrostatic actuators,
2 where n is an integer of, comprising the steps of:

3 providing a desired voltage output from at least one high voltage
4 generator;

5 connecting n switches to said voltage output and connecting
6 each switch to one of said n electrostatic actuators;

7 connecting n capacitors in parallel to corresponding n actuators
8 for receiving voltage from said high voltage generator through said
9 switch such that each capacitor and its corresponding actuator is
10 charged when said switch is closed to apply said voltage output; and

11 controlling said desired voltage with a central processor, said
12 processor further controlling the time each of said n switches is
13 closed to apply said voltage to said capacitors and electrostatic
14 actuators to restore said desired voltage therein.

1 21. The method of claim 20, wherein the output generated by said
2 high voltage generator is a constant high voltage.

1 22. The method of claim 20, wherein the output generated by said
2 high voltage generator is a constant slope, ramp high voltage.

1 23. The method of claim 20, wherein the output generated by said
2 high voltage generator is a multiple successive slope, ramp high
3 voltage.

1 24. The method of claim 23, wherein said multiple successive, ramp
2 high voltage contains different slopes to minimize the time of
3 actuation of said n switches.

1 25. The method of claim 20, wherein the output generated by said
2 high voltage generator is a staircase high voltage

1 26. The method of claim 20, wherein n is at least 1,000.

1 27. The method of claim 20, wherein n is between 1,000 and
2 10,000.

1 27. The method of claim 19, wherein said central processor
2 calculates the voltage leakage for each of said n electrostatic actuators
3 and capacitors to thereby determine the time said switch is closed.